West Sumner Quadrangle, Maine

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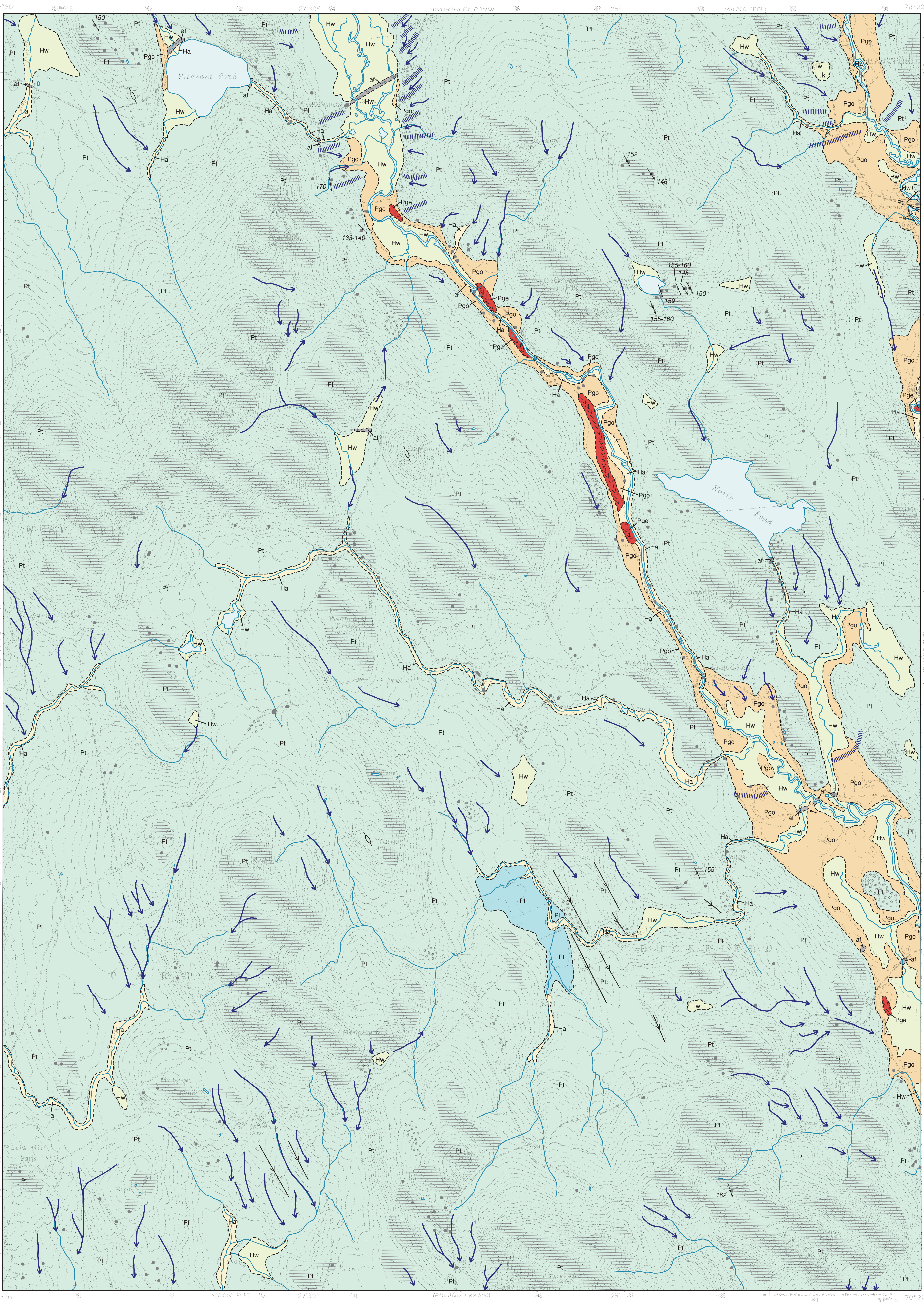
Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping of the West Sumner quadrangle was conducted by Carol T. Hildreth in 2005 for the STATEMAP program.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey West Sumner quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

NOTE: A thin, discontinuous layer of windblown sand and silt, generally mixed with underlying glacial deposits by frost action and bioturbation, is present near the ground surface over much of the map area but is not shown.

af — **Artificial fill** - Man-made. Material may vary from natural sand and gravel to broken rock to sanitary landfill. Includes highway and railroad embankments. This material is mapped only where it can be identified using the topographic contour lines or where actually observed. Minor artificial fill is present in virtually all developed areas of the quadrangle. Thickness of fill varies.

Ha — **Stream alluvium** (Holocene) - Sand, silt, gravel, and muck in flood plains along present rivers and streams. As much as 3 m (10 ft) thick. Extent of alluvium indicates most areas flooded in the past that may be subject to future flooding. In places the unit is indistinguishable from, grades into, or is interbedded with wetland deposits (Hw).

Hw — **Wetland deposit** (Holocene) - Muck, peat, silt, and sand deposited in poorly drained areas. Generally less than 3 m (<10 feet) thick, but may be thicker in bogs. In places, this unit is indistinguishable from, grades into, or is interbedded with stream alluvium (Ha).

Pl — **Glacial lake and outwash deposits in the Basin Falls Brook drainage** (Pleistocene) - Sand, gravel, silt and clay deposited by meltwaters in a shallow lake that occupied a section of the Basin Falls Brook valley that was temporarily dammed by a till ridge. Generally less than 3 m (10 feet) thick.

Pgo — **Glacial outwash deposits** (Pleistocene) - Mostly sand and gravel. Deposited by meltwaters adjacent to and downstream from glacial ice in the Nezinscot River valley (both East and West Branches).

Pge — **Esker and/or ice-channel filling deposits** (Pleistocene) - Mostly sand and gravel. Deposited by meltwater streams in ice tunnels (eskers) or in narrow fissures in the ice that were open to the sky at the time of deposition (ice-channel fillings).

Pt — **Till** (Pleistocene) - Light- to dark-gray, nonsorted to poorly sorted mixture of clay, silt, sand, pebbles, cobbles, and boulders; a predominantly sandy diamicton containing some gravel. Generally older than other glacial deposits and may underlie them. Thickness varies and generally is less than 6 m (20 ft) but may be more than 30 m (100 ft) in areas of streamlined topography. Many streamlined hills in this area are bedrock-cored.

Bedrock exposures - Not all individual outcrops are shown on the map. Gray dots indicate observed outcrops; ruled pattern indicates areas of abundant bedrock exposures and areas where surficial deposits are generally less than 3 m (10 ft) thick. Mapped in part from aerial photography; soil surveys (Wilkinson, 1986); previous geologic maps (Thompson and Borns, 1985) and materials maps (Locke, 1998).

Contact - Boundary between map units, approximately located.

Meltwater channel - Channel eroded by glacial meltwater or later stream runoff.

135 — **Glacial striation** - Point of observation is at dot. Arrow shows ice-flow direction inferred from striations on bedrock. Number is azimuth (in degrees) of flow direction.

Drumlin or other glacially streamlined hill. Symbol is parallel to direction of glacial ice movement.

Direction of paleocurrents that deposited sedimentary materials, as indicated by cross-bedding. Dot marks point of observation.

Abundant large boulders.

Grooved till surface - Symbols show lengths and direction of narrow ridges inferred to have been carved in till by flow of glacial ice.

Ice-margin position - Line shows inferred approximate position of ice margin during glacial retreat, based on topographic highs and a variety of other factors from place to place - including accumulations of surface boulders, associated coarse-grained stratified deposits, associated meltwater channels, etc.

>>>>> — **Esker segment** - A ridge of sand and gravel deposited by glacial meltwater flowing in a tunnel within or beneath the ice. Chevrons aligned along crest of esker and point in direction of inferred meltwater flow.

k — **Kettle hole** - Topographic depression left by the melting of a mass of glacial ice.

REFERENCES

Locke, D. B., 1998, Surficial materials of the West Sumner quadrangle, Maine: Maine Geological Survey, Open-File Map 98-246, scale 1:24,000.

Thompson, W. B., and Borns, H. W., Jr. (editors), 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.

Wilkinson, D. E., 1986, Soil survey of Oxford County, Maine: Soil Conservation Service, U.S. Department of Agriculture, 296 p., scale 1:20,000.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Hildreth, C. T., and Locke, D. B., 2006, Surficial materials of the West Sumner quadrangle, Maine: Maine Geological Survey, Open-File Map 06-19.
2. Neil, C. D., 2006, Significant sand and gravel aquifers of the West Sumner quadrangle, Maine: Maine Geological Survey, Open-File Map 06-74.
3. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print).
4. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.